

WHAT IS CLAIMED IS:

1                   1.       A cell culture of propagating pancreatic cells, wherein at least 50% of  
2   the cells exhibit CD56 as a cell surface marker and have an insulin:actin mRNA ratio less  
3   than 1:1.

1                   2.       The cell culture of claim 1, wherein at least 70% of the cells exhibit  
2   CD56 as a cell surface marker and have an insulin:actin mRNA ratio less than 1:1.

1                   3.       The cell culture of claim 1, wherein at least 70% of the cells exhibit  
2   CD56 as a cell surface marker and have an insulin:actin mRNA ratio less than 1:100.

1                   4.       The cell culture of claim 1, wherein at least 90% of the cells exhibit  
2   CD56 as a cell surface marker and have an insulin:actin mRNA ratio less than 1:1.

1                   5.       A cell culture of insulin producing cell aggregates, said cell culture  
2   produced from the propagating pancreatic cells of claim 1, wherein at least 50% of the cells  
3   exhibit CD56 as a cell surface marker.

1                   6.       A method of obtaining a culture of propagating pancreatic cells  
2   comprising:

3                   (a) isolating pancreatic cells from a pancreas;  
4                   (b) contacting the pancreatic cells with a CD56 binding reagent;  
5                   (c) selecting pancreatic cells that specifically bind to the CD56 binding

6   reagent; and  
7                   (d) separating the selected pancreatic cells from pancreatic cells that do not  
8   bind the CD56 binding reagent to obtain a culture of propagating pancreatic cells.

1                   7.       The method of claim 6, wherein the CD56 binding reagent is labeled.

1                   8.       The method of claim 6, wherein the step of selecting is done by  
2   fluorescence activated cell sorting.

1                   9.       The method of claim 6, wherein the step of selecting is done by  
2   panning.

1                   10.      The method of claim 6, wherein the CD56 binding reagent is an  
2   antibody that specifically binds to the CD56 protein.

- 1                    11.     The method of claim 10, wherein the CD56 binding reagent is an  
2     antibody that specifically binds to an oligosaccharide linked to the CD56 protein.
- 1                    12.     The method of claim 6, wherein the CD56 binding reagent is a lectin  
2     that specifically binds to an oligosaccharide linked to the CD56 protein.
- 1                    13.     The method of claim 6, wherein the CD56 binding reagent is a ligand  
2     of the CD56 protein.
- 1                    14.     The method of claim 13, wherein the ligand is selected from the group  
2     consisting of soluble CD56, heparin, and heparin sulfate.
- 1                    15.     The method of claim 6, wherein the pancreas is from a human.
- 1                    16.     The method of claim 6 which further comprises propagating the cells  
2     of step (d) and differentiating the cells into an aggregate of insulin producing cells.
- 1                    17.     The method of claim 16, wherein the step of differentiating the cells  
2     comprises culturing the cells on plates coated with collagen IV.
- 1                    18.     The method of claim 16, wherein the step of differentiating the cells  
2     comprises culturing the cells in a media comprising a differentiation factor.
- 1                    19.     The method of claim 18, wherein the differentiation factor is selected  
2     from the group consisting of hepatocyte growth factor, keratinocyte growth factor, and  
3     exendin-4.
- 1                    20.     The method of claim 18, wherein the differentiation factor is  
2     hepatocyte growth factor.
- 1                    21.     A method of producing an aggregate of insulin producing pancreatic  
2     cells comprising the steps of :  
3                    (a) isolating pancreatic cells from a pancreas;  
4                    (b) contacting the pancreatic cells with a CD56 binding reagent;  
5                    (c) selecting pancreatic cells that specifically bind to the CD56 binding  
6     reagent;

7 (d) separating the selected pancreatic cells from pancreatic cells that do not  
8 bind the CD56 binding reagent to obtain a culture of propagating pancreatic cells; and  
9 (e) differentiating the propagating pancreatic cell culture into an aggregate of  
10 insulin producing pancreatic cells.

1 22. The method of claim 21, wherein the CD56 binding reagent is labeled.

1 23. The method of claim 21, wherein the step of selecting is done by  
2 fluorescence activated cell sorting.

1 24. The method of claim 21, wherein the step of selecting is done by  
2 panning.

1 25. The method of claim 21, wherein the CD56 binding reagent is an  
2 antibody that specifically binds to the CD56 protein.

1 26. The method of claim 25, wherein the CD56 binding reagent is an  
2 antibody that specifically binds to an oligosaccharide linked to the CD56 protein.

1 27. The method of claim 21, wherein the CD56 binding reagent is a lectin  
2 that specifically binds to an oligosaccharide linked to the CD56 protein.

1 28. The method of claim 21, wherein the CD56 binding reagent is a ligand  
2 of the CD56 protein.

1 29. The method of claim 28, wherein the ligand is selected from the group  
2 consisting of soluble CD56, heparin, and heparin sulfate.

1 30. The method of claim 21, wherein the pancreas is from a human.

1 31. The method of claim 21, wherein the step of differentiating the cells  
2 comprises culturing the cells on plates coated with collagen IV.

1 32. The method of claim 21, wherein the step of differentiating the cells  
2 comprises culturing the cells in a media comprising a differentiation factor.

1 33. The method of claim 21, wherein the differentiation factor is selected  
2 from the group consisting of hepatocyte growth factor, keratinocyte growth factor, and  
3 exendin-4.

1                   34.     The method of claim 21, wherein the differentiation factor is  
2 hepatocyte growth factor.

1                   35.     A method of providing pancreatic endocrine function to a mammal in  
2 need of such function, the method comprising the steps of:

3                   (a) isolating pancreatic cells from a pancreas;

4                   (b) contacting the pancreatic cells with a CD56 binding reagent;

5                   (c) selecting pancreatic cells that specifically bind to the CD56 binding  
6 reagent;

7                   (d) separating the selected pancreatic cells from pancreatic cells that do not  
8 bind the CD56 binding reagent to obtain a culture of propagating pancreatic cells; and

9                   (e) implanting into the mammal the propagating pancreatic cells in an amount  
10 sufficient to produce a measurable amount of insulin in the mammal.

1                   36.     The method of claim 35, wherein the CD56 binding reagent is labeled.

1                   37.     The method of claim 35, wherein the step of selecting is done by  
2 fluorescence activated cell sorting.

1                   38.     The method of claim 35, wherein the step of selecting is done by  
2 panning.

1                   39.     The method of claim 35, wherein the CD56 binding reagent is an  
2 antibody that specifically binds to the CD56 protein.

1                   40.     The method of claim 35, wherein the CD56 binding reagent is an  
2 antibody that specifically binds to an oligosaccharide linked to the CD56 protein.

1                   41.     The method of claim 35, wherein the CD56 binding reagent is a lectin  
2 that specifically binds to an oligosaccharide linked to the CD56 protein.

1                   42.     The method of claim 35, wherein the CD56 binding reagent is a ligand  
2 of the CD56 protein.

1                   43.     The method of claim 42, wherein the ligand is selected from the group  
2 consisting of soluble CD56, heparin, and heparin sulfate.

- 1                    44.    The method of claim 35, wherein the pancreas is from a human.
- 1                    45.    The method of claim 35, wherein the mammal is a human.
- 1                    46.    The method of claim 35, wherein the propagating pancreatic cells  
2 differentiate into aggregates of insulin producing pancreatic cells after implantation into the  
3 mammal.
- 1                    47.    The method of claim 35, wherein before implantation into the  
2 mammal, the propagating pancreatic cell culture is differentiated into an aggregate of insulin  
3 producing pancreatic cells.
- 1                    48.    The method of claim 47, wherein the step of differentiating the cells  
2 comprises culturing the cells on plates coated with collagen IV.
- 1                    49.    The method of claim 47, wherein the step of differentiating the cells  
2 comprises culturing the cells in a media comprising a differentiation factor.
- 1                    50.    The method of claim 47, wherein the differentiation factor is selected  
2 from the group consisting of hepatocyte growth factor, keratinocyte growth factor, and  
3 exendin-4.
- 1                    51.    The method of claim 47, wherein the differentiation factor is  
2 hepatocyte growth factor.
- 1                    52.    The method of claim 47, wherein the mammal is a human.
- 1                    53.    A method of monitoring a culture of propagating pancreatic cells by  
2 a) contacting the pancreatic cells with a CD56 binding reagent; and  
3 b) determining the quantity of cells that exhibit CD56 as a cell surface  
4 marker.
- 1                    54.    The method of claim 53, wherein the detecting step is done by  
2 fluorescence activated cell sorting.
- 1                    55.    The method of claim 53, wherein the CD56 binding reagent is an  
2 antibody that binds specifically to the CD56 protein.